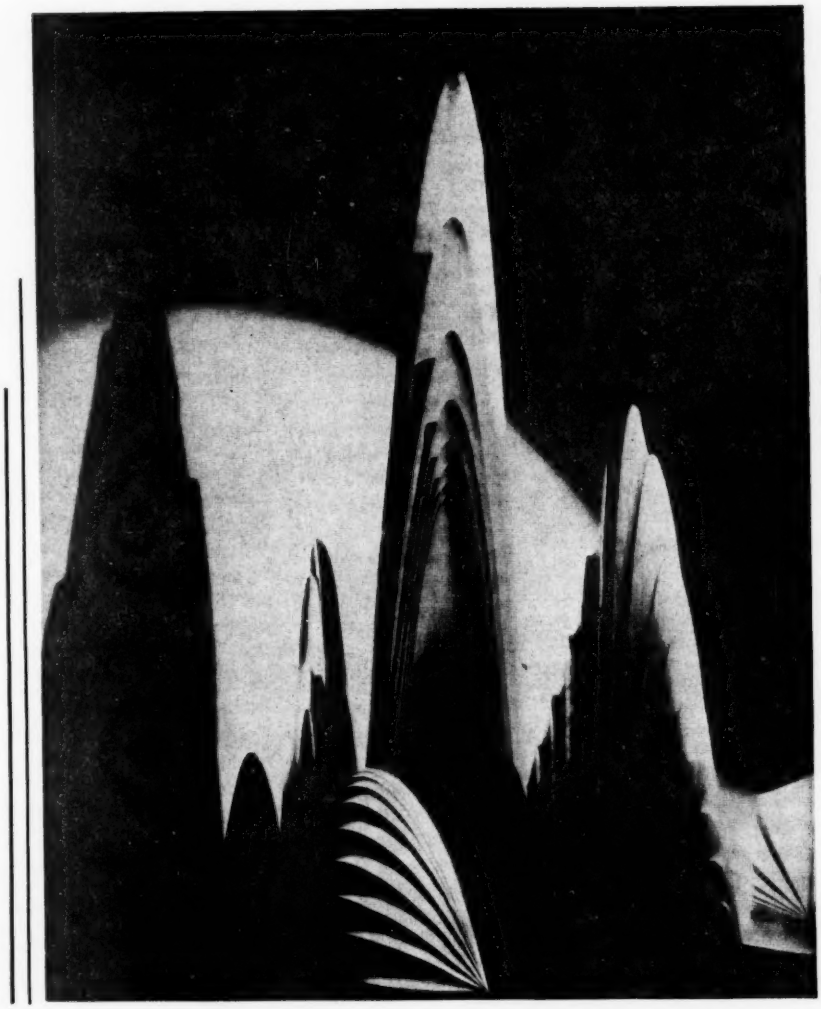
MAIN CURRENTS

IN MODERN THOUGHT



A MATHEMATICAL THEME IN DESIGN (see inside cover)

VOL. 10 NO. 2

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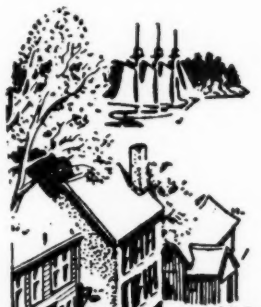
MAIN CURRENTS IN MODERN THOUGHT

A co-operative journal to promote the free association of those working toward the integration of all knowledge through the study of the whole of things, Nature, Man, and Society, assuming the universe to be one, dependable, intelligible, harmonious.



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The cover design, by Rutherford Boyd, is one of the still pictures used in the mathematical film *Parabola*. it is an artistic combination of parabolic solids with a sphere in the background. Courtesy of *Scripta Mathematica*.

AIMS OF THE FOUNDATION FOR INTEGRATED EDUCATION

The Foundation is incorporated under the laws of the State of New York as a non-profit educational organization. Contributions are tax deductible.

The corporate statement of Aims declares that the Foundation has been established:

1. To collect, create, and distribute authoritative materials which will encourage the development of unified overall concepts in education; to improve the balance of relationships between the physical sciences and the social sciences; to inquire into the phenomena of purposive activity in nature, man and the universe.

2. To assist teachers to understand and use such materials, and to develop an active, realistic, comprehensive philosophy which will communicate to their students the unity, coherence, and beauty of the world in which we live.

3. To remedy, solely by such educative measures, the conceptual and hence the ethical, social, economic, and political breakdown of our times, looking to a peaceful world order.

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The work of the Foundation is wholly educational, yet is referred constantly to the contemporary scene in all its aspects, no less than to the total available wealth of human experience and knowledge.

MAIN CURRENTS IN MODERN THOUGHT is published 5 times a year in Sept., Nov., Jan., March, and May, to call attention to significant contributions to learning currently being made by workers in the multiple fields into which knowledge has come to be classified. It relates these advances to each other and to the classical and contemporary views of Eastern, European and American thinkers. It is designed to save time for the reader by providing a vantage-ground from which the whole world of knowledge may be surveyed and kept in proportion as it moves toward integration. Its editors assume that the principles of art, the universals of philosophy, the laws of Nature and Man as formulated by science, and the truths of comparative religion, can be orchestrated into a harmonic, meaningful, ethical body of teachings which can and should be made the central core of curricular study in the educative process at all levels of development. In condensing text, square brackets [ ] indicate editorial interpolation. Three dots . . . in the text indicates a word, phrase or passage omitted in the interest of brevity or clarity. Other usages are standard. $3.00 a year. Foreign $3.50. Contributors to MAIN CURRENTS enjoy full liberty of opinion and expression in these pages.

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INTEGRATION IN SECONDARY SCHOOLS*

Herbert Espy

Maine Commissioner of Education

Challenge and Frustration In a Varied Curriculum

For people concerned with integration in education I can think of no better place to find both challenge and frustration than in the secondary-school curriculum. When I examine the secondary school's plan of study under ordinary circumstances I find many pleasant and comforting facts. However, in attempting to approach the secondary-school curriculum solely from the point of view of an integrationist, I find some rather disconcerting evidence.

Before going on to consider the secondary-school curriculum as such, I should like to point out and emphasize one very important and encouraging fact regarding the service of the secondary school as an institution in America. The secondary school is contributing a form of integration all its own to our American way of life. It brings together young people and their great diversity of talents. It unites all manner of strengths and weaknesses. Out of them it develops a degree of tolerance, of social acceptance, and a personal understanding that is one of the great strengths of our country. This contribution alone might justify the existence of our secondary schools, perhaps even outweigh many of their shortcomings in other aspects of integration. I would not want this contribution to be overlooked. Much as I might disparage the characteristics of the secondary-school curriculum from the viewpoint of the integrationist, I would like to have you count me as one who believes thoroughly both in the performance and in the promise of secondary schools. I am completely convinced that the present secondary education in this country is fundamentally sound.

If a friendly stranger — an integrationist — were to walk into an American secondary school not knowing its social purpose, its philosophy or rationale, he would undoubtedly have some very grave questions to ask. If he came as the integrationist, were to stay and observe the school's practices, he might find it hard to infer what its purposes are. He would see, for example, that we teach subjects called foreign languages. Our methods of teaching them he would discover as a sort of verbalistic ritual. Pleasant though it may be for its participants, this ritual is chiefly noteworthy for being somewhat ineffectual. Were the integrationist to look in on many secondary-school classes where English is taught, he would find much variety and perhaps some confusion. English teachers are expected to do so many different kinds of things that one can never be quite sure what to expect in an English class. The English teacher is expected to be a movie critic and a book reviewer. He is expected to give attention to the books the youngsters happen to be reading from the drugstore shelves. He is expected to give some attention to a few of Shakespeare's great plays, some attention to the techniques of writers, and to the personal biographies of authors both living and dead. He is expected to be a news analyst; he must also teach a little of the dramatical structure of language, and attempt to improve the form and clarity of the written communications of his students. In visiting English classes the integrationist would again encounter a certain kind of consistency in classroom procedure. Although the practice would be highly verbalistic and somewhat similar to the ritual in the foreign language classes, teachers and pupils would make little or no reference to related content in the foreign languages.

When the visiting integrationist observes the teaching of science subjects in the secondary school he is likely to find there no relation whatever between the factual content of the sciences and the content of the other school subjects. As in the case of the foreign languages, the sciences will show a great deal of dependence upon the use of text books, many of them written by our most notable university scientists. Although the visitor will observe a considerable emphasis on verbal activity, he will observe one marked contrast. Whereas instruction in English often encourages the student to do his own thinking and to express his own thoughts, science instruction ordinarily shows very little emphasis either on creative expression or upon personal initiative in the discovery of facts. However, the chief differences between English instruction and science instruction are differences in the variety and scope of the subjects taught. The activities of pupils and teachers in science classrooms are much less varied than those in English classes. The range of topical content is also much narrower. Whereas in English classes there is much consideration of persons, personal qualities, and historical developments, the science classes would concern themselves hardly at all with humane values, and science would be taught as if it were a sort of pre-existent hierarchy of facts and formulae — without history, humanity, arts, or values.

*From a talk given at the 1953 summer workshop of the Foundation for Integrated Education at the University of Maine.

Thus far the integrationist surveying the high-school curriculum would find the pupils giving their time to verbalistic rituals the majority of which are superficially patterned after the structure and statements of their textbooks.

Now let us look at a field we call vocational agriculture. There the integrationist will find so great a difference as to make it hard to believe that the subject should be taught in the same high school, and that it is taught by teachers with anything like the same philosophy or purpose. He will find here a richness of activity, a balance of educational nutrient that he would never expect to find after watching the instruction in languages or the sciences. For example, it is customary to find the agricultural teacher making use not only of textbooks, but research publications, which students are invited to read and study. The use of laboratory demonstrations as well as materials and equipment in a farmshop are all part of the course. Here the teacher is encouraging and helping his pupils to carry on whole projects on their own farms, in which they will plan an enterprise of some sort, keep books on it, study it, work with it, pray over it, and get their parents to assist them with it. This activity is so rich it even includes the sending of some of these youngsters to foreign lands where they may further their study. (Two students from the State of Maine are at present over-seas in connection with their agricultural studies. One of them is in Scotland, I believe, and the other is in Finland.) For some reason instruction in agriculture includes a greater variety of materials and activities than is likely to be found in the teaching of any other secondary-school subject. If that broad gamut — research materials, textbooks, laboratory and shop activities, projects at home, and international visitations — is necessary and desirable in the teaching of vocational agriculture, our visiting integrationalist might well ask how it is that we presume to be effective in our teaching of language and the sciences with a much more ritualized and restricted educational diet.

These discrepancies in the teaching of different subjects reflect a lack of unity among their teachers. Indeed it is fair to say that teachers of the older and more linguistic subjects are not even acquainted with what is taught in other fields. It is almost unheard of for teachers of different subjects to be collaborating frequently in the conduct of their work. Indeed there are many schools in which teachers of different subjects have never observed one another at work.

This lack of integration in the activities of secondary-school classes and in the thinking of secondary-school teachers reflects the fact that the secondary-school curriculum is not the product of thoughtful planning and design. The secondary-school curriculum is rather an accumulation of residues from many cultural tides which have passed over the system. In the early days of our country the secondary school was devoted largely to the teaching of good literature. With the passing of many decades that function has continued, but instruction in literature has been infiltrated and adulterated with such a great variety of new purposes and practices as to make the teacher's task confusing and frustrating. In the middle of the nineteenth century the American academy developed in response to popular demand for instruction in a broader curriculum. The academy introduced the arts and the rudiments of science. It did not, to be sure, pay much attention to vocational preparation. Vocational guidance in the American community of the 1850's would have been a waste of time. The butcher, the baker, the doctor, and the horseshoer — all of the occupations of men whether respectable or not — were an integral part of each community. The youngsters knew them all. There was no need for a school to give him vocational preparation or vocational guidance.

When the first public high school was developed about 1890 educators made great strides in developing the study of scientific subjects in the secondary school. Very naturally, these studies were patterned after the then popular German ideals of scientific specialization, the kind of specialization that was gloriously exemplified at that time by Johns Hopkins University. The narrowly restricted science instruction of the turn of the century has persisted with relatively little change.

Because America had become so much interested in vocationalism by 1920 and because the colleges of agriculture and their experiment stations had for fifty years been developing some of this country's finest research and adult education, the secondary schools were fortunate in being able to profit by this earlier progress. It is perhaps for that reason that the courses in agriculture display a richness not to be found in the teaching of any other vocational subject. For example, our school instruction in business education is almost as textbookish and verbalistic as our instruction in languages and mathematics. The business-education courses do, however, provide for urban boys and girls some work experience in out-of-school employment — an advantage seldom offered to boys and girls taking the same subjects in rural or suburban schools or to pupils enrolled in other subjects.

Vocational education in industrial subjects differs from most of the other secondary-school subjects in that the school is often equipped with power-driven tools comparable to those used in industrial enterprises. This material richness, however, is not in any way reflected in the breadth or variety of the content of instruction. All too unhappily, I believe, our industrial vocational education in the secondary school reflects our narrow conceptions of industrial work. The subjects are taught as if they were devoid of any major

concern for social, civic, humane, or personal values. Highly routinized, precise, orderly production is the major emphasis. Lest it be thought that these qualities should be charged against the secondary school, let it be remembered that these instructional patterns developed at a time when American industry was not noteworthy for the breadth and humanity of its attention to the industrial worker.

It is all too clear that the secondary school has tended chiefly to perpetuate the original types of instruction, without endeavoring to synthesize them or to develop much consistency among the different courses. The courses seemed simply to drift into the curriculum and accumulate there. Their lack of unity and harmony and the complete absence of anything like comprehensive design or over-all purpose make it difficult for an inexperienced youngster to find unity in his education.

Surely it was to be expected that some effort would be made to alleviate the difficulties of students. One of the most persistent and widespread efforts was begun by a small group of zealots in the early 1920's. They called for the introduction of something known as "guidance" in our schools. The movement for guidance had undoubtedly been very necessary, and it would not have lasted as it has if it had been completely ineffectual. I believe, however, that it is fair to say that the guidance movement has not been wholly successful in making the secondary school a well integrated experience for most pupils. Indeed, it would have been too much to expect that this could be done. The secondary-school program so fundamentally lacks integration that only a more fundamental remedy will serve. To my mind the most effective way in which integration could be achieved in the secondary-school program would be through the preparation of teachers for those schools. If the teachers were themselves profoundly and vitally interested in an integrated program; if they had common insights and understandings; if they too had some common vision of what an integrated secondary-school curriculum would be, the integrationist should cease to worry about integration in the secondary school. Until we do have such teachers in much larger measure than we now have them, any amount of rearrangement of the outlines of the curriculum will be as futile as many other efforts and solutions have been. Just as we cannot hope to improve integration by any sort of reshuffle in the program of subjects, so we cannot hope to improve the teaching by attacking the secondary schools directly. Any substantial improvement must be accomplished in the preparation of the teachers themselves.

Those of you who are college teachers must know the great responsibility attached to your work. You are the models and the inspiration for the young people who will be the secondary-school teachers of the future. They come to you as students, and what you are, they are; what you teach, they teach; and what you inspire, they will likewise inspire.

Having spent most of my professional life in universities, some of the most inspiring experiences I remember have been my daily contacts with college teachers. I know their high idealism and the seriousness with which they evaluate their important work. I regret to say, however, that most of us at the college level are afflicted with a kind of irresponsibility for secondary-school education. There are, to be sure, happy exceptions. It was very heartening for me to see Dr. James Conant, the 23rd President of Harvard University, develop his strong interest in secondary education. Other college teachers could also be cited as encouraging exceptions. In general, however, we college teachers have this feeling of immunity toward secondary-school problems. How often during the school year has any one of us devoted at least one full day to a visit in a secondary school? How much time has any of us spent with secondary-school teachers and the pupils in their classes? How many of us attend, or you might ask, how many of us are invited to attend secondary-school conventions or conferences? The high schools have long since declared their independence and made it clear that they do not desire to be dominated by the colleges. But if this problem is to be dealt with constructively, college teachers and high-school teachers must find more ways to work together in their common enterprise. Although I have high hopes of the values which will accrue from joint work on the part of teachers in high schools and in colleges, I think it is only fair to point out that such cooperative considerations will soon emphasize the fact that secondary-school teachers are trained in colleges and in universities, and that they get from those colleges and universities their ideas concerning curriculum patterns. If the secondary-school curriculum lacks integration, the persistence of that lack of integration is in large measure a consequence of our use of college curriculum patterns in which integration is not a major characteristic.

Accordingly, I should expect that one of the most fruitful subjects for cooperative study by college teachers and high-school teachers should be the curriculum pattern of the colleges and universities which prepare teachers for the high schools.

A second area which is now all too little recognized by institutions which prepare teachers for the secondary schools is a problem which is characteristically American. It does not exist to anything like the same degree in any other country. Here in America the secondary-school teacher must be all things to all men. Pupils in our secondary-school classes are so diverse in need, so diverse in talent and in interest, so diverse in cultural background as to confront the teacher

with pedagogical problems of the utmost complexity. Although many teachers are struggling manfully, it is too much to expect that they should have been able so soon to invent effective new teaching methods to meet the diverse needs and qualities of an American high-school class. Until much more progress has been made in these directions, we had best be patient in judging the high-school curriculum for its lack of integration.

This important matter, the need to invent and develop new teaching methods to meet the diversity of American pupils, suggests a related condition of the utmost importance. It has become commonplace in this country to speak of what is called the teacher shortage. Most people who speak of this shortage appear to think of it mostly in numerical terms. Particularly as we consider seriously the need for more integration in the secondary-school curriculum and as we ponder the necessity for improved teaching methods to meet the diverse needs of pupils as individuals, we must be struck with the need for recruiting young teachers of the highest talent. Unless we can count upon getting larger numbers of very able young men and women into this complex task, we should not be too hopeful about achieving greater integration in the secondary school. Indeed, unless we can get such teachers in considerable numbers, I see no other choice than to simplify our secondary-school program. And make no mistake about it. Simplification of some sort is bound to occur at the hands of less able teachers. Unless we can provide for the less able teacher a program which is simpler by design, that teacher through his own inadequacies will so conduct his work as to simplify it by reducing it to a dull formalism.

It is natural that the integrationist looking at the secondary-school curriculum should note the differences and disparities which prevail among the different school subjects. It is also natural that he should perhaps want to take a simple direct road toward synthesis or integration.

Teaching, however, is such a deeply personal process that the only sure route to progress is through the improvement of the education of the teacher himself and through selection of teachers to the end that the secondary school will have the benefit of the finest teaching talent to be found anywhere.

I hope you believe with me that our secondary-school curriculum should be so designed as to portray truly the culture and civilization in which we live and that teachers should so teach it that all our young people, of whatever degree of talent and kind of interest, may find in it inspiration and competence for living in today's world. The best integration, indeed, perhaps the only genuine integration is the integration which takes place in the subtle, indescribable magic with which an artistic teacher helps a questing pupil to find harmony and purpose in his own life.

INTEGRATIVE PROGRAMS IN COLLEGES

MICHIGAN STATE COLLEGE

Michigan State College has been giving since 1944 a program of basic education for all undergraduate students, the major purpose of which is "to help students learn to live more intelligently in a free society."

Specific objectives are: "1. To assist in the development of each student as a more wholesome individual and as a more effective citizen. 2. To provide a basic program of educational experience for all students. 3. To bring together into meaningful relationships those subject areas contributing to general education. 4. To provide exploratory opportunities for those students desiring additional experience before choosing a major field of concentration. 5. To help all students acquire better study and learning skills; develop more effective personal traits; become more able in personal, social, civic, family, and leisure time activities. 6. To make counseling services available to all students in order that their educational, vocational, and personal problems might be given adequate attention. 7. To provide opportunities for able students to accelerate or to enrich their programs. 8. To provide two-year self-contained, terminal programs for students needing less than four years of college work. 9. To build closer relationships between Michigan State College and the high schools of this state. 10. To assist the junior colleges in the development of their programs."

In these seven years, the program has evolved into four integrated and interrelated courses in general education which attempt to provide a broad core of knowledge upon which vocational training can be built.

The four basic courses, each covering three quarters, are outlined below. We give more attention to the first two, which approach integration from a somewhat more conceptual level:

Natural Science

"This course is concerned with teaching selected major facts and concepts of the natural sciences;

with the relation of these facts and concepts to man; and with the teaching of the methods, the potentialities, and the limitations of science.

"The facts and concepts of science are woven deeply into the fabric of the culture to which we belong. Knowledge or lack of knowledge of them and their relations to man affects man's behavior relative to his environment, to his neighbors, and to society as a whole. Likewise, science as a cultural process is a significant factor in the modern world. Its utilization as a constructive social force depends on a general public awareness of its methods, its potentialities, and its limitations.

"The textbook, syllabus, and lectures are concerned primarily with certain selected facts and concepts of science. The laboratory classes also deal with subject matter, but they do so in a framework of the scientific process, which requires the student to employ the methods of science in dealing with the facts and concepts and so gain some knowledge of our practice in the use of this thinking process."

The first quarter covers: "Reproduction, heredity, and cell theory. . . . The area of reproduction and cell theory is presented so as to demonstrate the function of empirical trial and error methods in science, while heredity exemplifies the significance of the use of broad theories or conceptual schemes. Emphasis is placed on the human use of knowledge of reproduction and heredity."

The second term is concerned with "the nature of matter and energy as explained by concepts of heat, atomic-molecular theory, and metabolism in animals and plants. As in the preceding term's work these subject matter areas are approached from the point of view of the methods involved in their development and followed by a discussion of the impact they have had on social man."

The third term of the natural science sequence involves "a consideration of geological processes of the earth and organic evolution. The scientific methods involved and the social and cultural consequences of the historical development of the areas are considered."

Humanities

"The purpose of this course is to study man as a unique, created and creative being. By means of examination and discussion of the principal experiences and ideas which from the age of Greece to the present time have shaped the nature of Western man and his civilization, the course endeavors to enlarge and to enrich the student's comprehension of his historical heritage, to deepen the degree of his intellectual maturity, to enhance his sensitivity to humane values in all fields of man's thought and endeavor, to elevate his ethical outlook, and to make him intelligently aware of his own worth and dignity, his obligations and responsibilities, as an individual human being.

"The sources for this study of man are drawn primarily from the fields of history, philosophy, religion, literature, and the arts."

In the first quarter principal subjects treated are: "Humanities as a field of study and in relation to general education; the classical background of Western man as seen in the Greek pattern of community life, religion, philosophy, literature, and art; the Roman contribution as seen in the imperial idea, in concepts of the good life, in architecture and engineering, and in the development of law; the Christian roots of Western civilization as seen in its spiritual foundations, the basic teachings of Jesus Christ, and the growth of the early Church."

In the second quarter principal subjects are: "Medieval man in Western Europe; his economic life on the manor and in the towns; his political ideas and practices in feudal times, influences from Islam and the East; the creation of a Christian synthesis in spirit, thought, education, literature, art, and music; the emergence of modern man and modern forces in Western civilization; the transition to a dynamic capitalist economy; development of the nation state; humanism as expressed in literature, art, and music; the Protestant Reformation; growth of rationalism and science."

The third quarter treats: "Foundation of the modern outlook as found in the politics, thought, literature, and art of the Enlightenment; the liberal revolutions in democracy, romanticism and idealism in philosophy and the arts, impact of the machine, advance of science, nationalism and imperialism; attacks on liberalism from the right and the left; break-up of the liberal order; effect of the World Wars; rise of collectivism; the new science, anti-intellectual philosophies; experimentalism in the arts; East meets West: One World?"

Communication Skills

This course is designed to help students think, speak, write, and understand English effectively, to clarify and to communicate ideas efficiently and effectively. The first term comprises an overview of the total communication process, the second emphasizes the investigating and reporting of the work of others, and the third term treats of problem solving and persuasion, dealing with the logical and psychological types of approach.

Social Science

The purpose of this course is "to provide the student with some basis for understanding the changing-expanding nature of American society" and "his role in social change" . . . The course seeks to show how the scientific analysis of human relations in modern society may provide the tools and knowledge through which the individual may achieve his and society's goals . . . The three terms are organized around three problem areas: (1) How to orient new members of the group to the prevailing patterns of behavior; (2) How to satisfy human needs and wants; (3) How to regulate and control human behavior."

PARAPSYCHOLOGY, 1953

Viewpoints and Data On a Frontier Science

Our long-term readers are familiar with our editorial position with respect to science in itself, and as part of cultural experience. For newer subscribers, we may say that a primary obligation of the scientist, in our opinion, is to be eager to know of new data, and to welcome particularly empirically established items which call upon him to alter, not his basic methods, but the world view he currently possesses. He is certainly, at the least, duty-bound not to reject summarily what, on its face, may challenge his previously avowed opinions. For the philosophical structure of scientific thought can be improved only if the new is welcomed, neither accepted nor rejected on hearsay or prejudice. This should be basic in the discipline. It should need no asserting.

The papers which follow are based upon long years of close acquaintance with data to be found in the volumes of the appropriate journals of a discipline which, like social physics, or aesthetic measure, calls for much careful reflection because it lies between two or more recognized areas. This extraordinary reach of parapsychology is Dr. Rhine's concern, as it was of William McDougall in his prescient ***Body and Mind, a Defense of Animism.***

The question is sometimes still raised as to the validity of the statistics used in parapsychological experiments. In a recent letter Dr. Rhine says: "So far as I know, we have had a pretty solid backing from the American statisticians." In 1937 Burton H. Camp, president of the Institute of Mathematical Statistics, issued the following statement: "Dr. Rhine's investigations have two aspects; experimental and statistical. On the experimental side mathematicians of course have nothing to say. On the statistical side, however, recent mathematical work has established the fact that assuming that the experiments have been properly performed, the statistical analysis is essentially valid. If the Rhine investigation is to be fairly attacked it must be on other than mathematical grounds." (For a review of basic procedures in use up till 1940 see ***Extrasensory Perception After Sixty Years,*** Pratt, J. G., Rhine, J. B., et al, pub. by Henry Holt and Co., N.Y., 1940.)

We may briefly respond to Dr. Rhine's question as to whether the new findings are the only or chief weapon with which to pierce the armor of communism. Surely the general recent development of the idealistic elements of empirically verified science (such as genetic theory, quanta, and relativity) is a much more powerful engine for this purpose? It is the true opposite to dialectical materialism. True, it is much more difficult to maneuver into place, and use with telling effect, just because it is so many-aspected. It must, nevertheless, in fact, one day prove decisive. Today realism approaches idealism. It can be counted upon even to provide the theoretical structuring which will permit us to understand parapsychology itself, which special study at the moment can be used with only small effect, being so largely empirical and so isolated structurally from other generally accepted theory.

We are grateful to Dr. Gardner Murphy for the following account of integrative aspects of the international parapsychology conference at Utrecht. — F.L.K.

INTERNATIONAL CONFERENCE AND PERMANENT HEADQUARTERS

At the University of Utrecht, Netherlands, sixty-three workers in the area of parapsychology gathered in August, 1953, for discussion of their research problems. Much of the area of parapsychology, including telepathy, clairvoyance, apparitions, precognition, movement of objects without contact, etc., was considered — either through fresh research reports or through integrative summaries. Four working groups were established, concerned respectively with 1) quantitative problems, 2) qualitative and spontaneous phenomena, 3) the approach through psychiatry, and 4) the personality of the sensitive. The reports of research done and of viewpoints discussed will appear ultimately in a *Proceedings* published by the permanent parapsychology headquarters to be set up at the University of Utrecht.

The integrative role of the Conference became very apparent in the smooth functioning of the international Executive Committee which made the plans and through the genuine internationalism of the whole Conference atmosphere. This sense of unity in aim was further brought out by the participation of people from fourteen different countries, and from such widely varying specialties as anthropology, chemistry, physics, philosophy, psychology — the philosophers playing, as a matter of fact, a huge role in attempting to get an overall view of the phenomena and a way of thinking which would bring them into coherence.

It must be admitted candidly that the data from these various fields are not as yet in an order which easily permits classification or integration, but the ideal is recognized. Such integration as already exists among physical, biological, and social sciences was evident in the efforts at integrative thinking in making sense out of the scattered data of parapsychology. Whether parapsychology can itself become an integrative subject or must, for the present, serve as recipient of the integrative gifts of other fields, will not be answerable until its own maturity in research concepts and methods is much greater than at present.

—Gardner Murphy

EXTRASENSORY PERCEPTION AND ORTHODOX PSYCHOLOGY

Robert H. Thouless

Cambridge University

Why should the work of J. B. Rhine and the other parapsychologists on the psi phenomena (extrasensory perception and psycho-kinesis) be taken seriously when the majority of American experimental psychologists are very sceptical about the soundness of their conclusions? This question is one that awakens echoes from the past.

About three centuries ago men may have asked why they should take seriously Harvey's idea that the blood was pumped by the heart through the arteries and the veins when all the anatomists of established reputation rejected his findings.

A few centuries earlier, the enquirer might have asked why he should take seriously the idea of Copernicus that the earth moves round the sun when all the cosmologists of established reputation knew that the earth was the center of the universe and that the sun and the stars moved round it each day. And so on through the ages.

The liberal individual is inclined to be impatient of established authority, and to complain that authority is always wrong in opposing novelties in thought. The matter is not, however, so easy as that. It is one of the jobs of established authority in any field to criticize novelties, and novelties in thought very often turn out to be wrong. Scientific advance takes place by the interaction between new ideas and the conservative forces which only admit them to the position of established items of knowledge when they have proved themselves. One cannot properly blame established authority for being critical; its critical attitude may sometimes go on too long.

It is the business of a watch-dog to bark when a stranger knocks at the door. One can blame the watch-dog only if he goes on barking when the master of the house has investigated the stranger and finds that he is no burglar but a worthy guest. The psychologists were right to bark at the parapsychological work at its beginning. Have they gone on barking too long? I think they have.

I can myself more easily sympathize with the somewhat suspicious attitude of experimental psychologists since I shared their suspicions when I first became acquainted with the experimental work in parapsychology. However, eight years later (in 1942) I wrote that the work of Rhine, Soal, Tyrrell, and Whately Carington "have put beyond question both the reality of the phenomenon and the possibility of its demonstration by experimental methods."

Since then parapsychology has seemed to me to be a subject deserving of more concentrated effort in investigation than it is at present getting. My critical activities have been limited to an occasional growl when a particular parapsychological investigation seemed to me to fall short of the standards which experimental parapsychologists have set themselves. These standards seem to me to be as high as those in other branches of science that I know.

While I have changed my mind about the value of parapsychological researches, a great many other experimental psychologists have not. A survey of opinion amongst psychologists published by Dr. Warner in the *Journal of Parapsychology* last December showed that only 2½% of psychologists were prepared to say that ESP was an established fact, while 10% regarded it as impossible. The weight of authority behind the latter opinion is reduced when we find that of this ten percent who regarded ESP as impossible, exactly one-half had formed this opinion on purely *a priori* grounds, without any consideration of the evidence. The great majority of the psychologists (73%) regarded ESP as either a remote possibility or as merely an unknown.

While these figures show that there is some weight of opinion amongst experimental psychologists against the reality of parapsychological phenomena, this weight must not be exaggerated. There are many outstanding exceptions, such as William James of Harvard, William McDougall of Duke University (instrumental in founding at Duke the first parapsychological laboratory in a university), and Gardner Murphy, now at the Menninger Foundation, who has organized parapsychological researches in his own laboratory at City College, New York. Increasingly I find in talking to experimental psychologists both in Great Britain and in this country that they give to parapsychological findings the same respectful attention as they would to any other psychological researches outside their own direct field of interests. However, the experimental psychologists sympathetic to parapsychology are a minority and we may reasonably ask why.

Every psychologist who has lived through the last thirty years is aware that he has passed from a time when a worker in one of the established sciences would have regarded him as a kind of philosopher who dabbled inexpertly in trivial experiments to a time when he is regarded, however grudgingly, as also a kind of scientist. This status is one that he values, and it is somewhat imperiled if he is known to work in such a dubious field as parapsychology. So, while the findings in parapsychology may be assimilated by a zoologist (as Professor Hardy of Oxford), a neuro-physiologist

(as Professor Eccles of Canberra), a physicist (as Dr. Johnson of Melbourne), there still remains a tendency for experimental psychologists to be suspicious and hostile.

Another factor of at least equal importance is that these findings challenge the theoretical foundations on which experimental psychology has been built. This theoretical foundation has been a mechanistic theory of mental activity: the idea that all mental activities, such as thinking, imagining, judging, making decisions, etc. are, in principle, explicable by reference to the properties of the physical organism. Everyone admits, of course, that in practice they cannot yet all be so explained, but the mechanistic view is that with sufficient knowledge they could be. Such phenomena as telepathy, clairvoyance, pre-cognition and psychokinesis, on the other hand, look as if they cannot, even in principle, be mechanically explained. The admission of these as facts would imply, therefore, that the mechanistic point of view in psychology must be given up. The idea of giving up the basic point of view on which one's science has been built is not unnaturally an unwelcome one. We all prefer security and stability in our thought.

There are, I think, two things which may be said to modify this sense of insecurity. First, if one's basic theory has to be radically revised, much less is lost than appears at first sight. Not one experimentally established fact is changed by the proving false of one's basic theory. The second point is that this has been amply proved in the history of the more developed sciences. Physics provides us with plenty of examples of fruitful work being based on erroneous theories which have to be drastically modified as new ranges of fact are investigated. I have had the privilege of talking with one of the leading research physicists about our work in parapsychology. His attitude towards it seemed more receptive than that of the average experimental psychologist. He may have found it surprising but physics had taught him to expect to be surprised; experimental psychologists have not so far had the experience which leads them to expect to have to face facts which conflict with their basic expectations.

Finally, one ought perhaps to say if experimentally ascertained facts conflict with one's previously accepted guiding theories, then those guiding theories have to be abandoned, whether one likes it or not.

Since 1927, the experimental evidence for paranormal right guessing (now called ESP or psi) has become overwhelmingly strong. For instance, in the Pratt-Woodruff series, the probability against the change occurrence of the results was of the order of a hundred thousand billion to one, while in the longer Soal-Goldney experiment it was even larger and reached the astronomical figure of 10^{35} to 1.

I wish to suggest as the upshot of this discussion that those interested in the investigations made by parapsychological experimenters should not be put off by expressions of disapproval that they may hear from some of the more orthodox scientific psychologists. The watch-dog of established authority is barking, and it is its duty to bark. We should not accept the watch-dog's opinion as a final authority, but look into the matter for ourselves.

A SCIENTIFIC APPROACH TO THE PROBLEMS OF RELIGION*

J. B. Rhine

Duke University

What is religion? That we must know before we can circumscribe its problems. There is, of course, a great deal of practice and ceremony, and art, and education, all concerned with the doing side of religion, but back of it all is a theory — a conception of man's relation to the universe as a personal or spiritual system. This assumption of a spiritual element in man and nature is inherent in religion.

But what, specifically, is a spiritual quality? As nearly as it can be translated into words in common usage today outside of the language of theology itself, spiritual means non-physical or extra-physical. The assumption, then, taken for granted by every religion, is that there is something non-physical in the universe. We cannot hold with those who would have us preserve a blind, uninquiring faith in our minds concerning these problems of central importance to mankind, while at the same time, we teach our young people with all our resources to inquire, to question, to search openmindedly in all other areas of inquiry and truth-seeking.

But can we ever be certain about such things? It would be ridiculous today to say we cannot investigate the invisible or the intangible and reach some reliable conclusions about them. Indeed, large areas of some of the sciences are entirely confined to the study of processes not directly available to the senses — processes that can be discovered and studied only through their effect upon other operations that the senses can detect.

Whatever we mean by non-physical, we clearly do not mean putting non-physical processes beyond the reach of study or experience. Like most of the invisible physical phenomena now being

*Abridged from a talk to the Unitarian Colloquium on the Nature of Man.

studied in the laboratory, a non-physical process would have to be converted into physical effects that could be registered, measured, and evaluated. Any phenomenon, then, that is convertible, either to direct sensorial experience or to the instruments of measurement, becomes available to the observer and the scientist. Only a happening that leaves no trace, affects nothing else which brings it within the reach of man and his instruments, could be said to be beyond the reach of the inquiring mind of man; the very existence of such an unobservable element of nature would be beyond discovery and hence a subject of idle and pointless speculation.

If, now, we agree that we want to know, that it is important that we do know, and also that we *can* know and make sure about these questions of religion, how is it to be done? Not by the unchecked and unverifiable personal experiences of the mystic, the seer, the prophet or the religious authority, whatever his creed or character. While we cannot deny that insights may come in the form of personal experiences that can play an important part in the advancement of human happiness, in the form of ideas that may have great social value, still these experiences cannot constitute proof of anything.

There is no way by which speculative and reflective thought can provide sound factual answers to these questions of religion.

There is, however, a method of making sure of the answers to our questions that has in a general way come to be called scientific method. Certain of its ways of answering questions are general enough to apply to any field of problems although of course special techniques must be worked out to deal with the specific conditions and principles involved.

Since the problems of religion are essentially the problems of personality in the larger significance of the word, and hence those of a broad and liberalized field of psychology, the methods appropriate to that field are to a large extent adaptable here. The branch of psychology most advanced in the techniques appropriate to the problems of religion is the one that has come to be called parapsychology. It is the branch of science dealing especially with non-physical powers and functions of personality known as psi processes, popularly called psychic.

The most basic problem of all religion has been mentioned: the question of whether there is *anything* spiritual in the universe. Every other conceivable problem concerning religion, great or small, depends on an affirmative answer to this question.

Assuming for the moment that the answer is a positive one, it would be important next to discover to what degree this spiritual factor is a part of human personality, how much of a part it represents, and how it interacts with the physical aspects of the man and his environment.

Continuing with the same assumption of an affirmative answer, there would follow the question of the universal origins, the sources of this spiritual component. Is there a world order of a spiritual character or is the spiritual component merely a scattered effect within the individual himself? Is there a spiritual system of nature, an oversoul, a reservoir; is it personifiable according to the conception of a personal deity?

What exchange between the individual and this larger order of spiritual reality might be discovered and effectively demonstrated?

Is there an over-all unity of purpose and intelligence shown in the phenomena of nature; and if any is discovered, what may mankind achieve through these insights and through a consequently more intelligent adaptation and identification of himself with the spiritual personal forces of the universe?

Perhaps the greatest question of all is simply, what is there in our ignorance, our backward looking, word-bound mentality that we are still too ignorant to ask?

I come back to the branch of psychology mentioned earlier, parapsychology — the investigation of all aspects of personality that challenge physical expianation. It is a branch of inquiry that arose partly in consequence of the clash between the materialistic trends of science and the disillusionment which nineteenth century materialism brought about in religious thought in the Western World. As a result of the conflict produced in thinking men with regard to religious doctrine, there was a natural turning to those aspects of religious behavior that offered some show of proof.

Slowly, the thought became formulated that if mind could make direct contact with mind in an extrasensory mode of thought transference there was an answer to materialism that could be demonstrated experimentally. If telepathy, as it came to be called, could be shown to take place under conditions that science could accept as adequate to rule out other explanatory principles such as the senses, science would itself be producing results that challenged a physical theory of human personality.

As the decades passed the problem of extrasensory perception (ESP) worked its way into the university laboratory, first for critical rejection and, eventually, for established acceptance. Out of the work as a whole the following picture appears:

Extrasensory perception is an unconscious operation subject to some degree of volitional control but unreliable because of the absence of any introspective guidance in determining when and, indeed, whether it is operating at any given time or trial. It has been found to be independent of those main criteria of physical operations, time, space, and mass, as far as it has been possible to subject it to comparative study on those lines. No relation has been found, under test conditions,

between ESP scoring and distance of the subject from the person or object which he is trying to contact. Even time has not been found to limit the functioning of ESP, and an experimental foundation has been established for the age-old hypothesis of prophecy, not as a divine but as a common human attribute.

But however exceptional these capacities, now known as psi, have proved to be in the total scientific picture, they follow the general principles of personality. They involve intelligent, purposive action, are affected by conditions of reward and punishment, and in general follow the same laws of motivation with which we are familiar in the less obscure functions of the mind.

From a point of view of detachment, either that of science or of religion, the discovery and establishment of extrasensory perception as a function that does not fit into physical theory might safely be considered to have revolutionary significance. It is difficult to see how any philosophy of materialism can survive when the consequences of the psi researches are duly faced.

From these research findings that certain subjects under favorable conditions can produce test results that could not have been produced by physical operations, as physics is defined today, we can safely conclude that there is something operative in man that transcends physical law and, therefore, by definition, represents spiritual law. The universe then is one about which it is possible to be religious. What lies behind these fleeting effects we must, as scientists, restrain ourselves at present from attempting to say. The analogy of discovery in all other fields, and the glimpses we have had in our own, lead us to suspect that there is a great hidden system of operations behind these transient phenomena.

There have been many warning voices among our more thoughtful analysts of the great issues before the world today, pointing out that we are not attacking the basic issue of communism. Communism, however, *is* attacking the basic issue in its offensive against the culture of the Western World. It claims that its philosophy of materialism is scientifically sound and that it is building logically and scientifically on the basis of that fundamental conception of man. We are arming against it, and both in government and in our institutions (especially in some of the church organizations) there are bitter attacks upon its practices and its conclusions. There is counter-propaganda and the use of a wide range of armament and instrumentation to defeat it; but is there anything except the findings of parapsychology that directly confronts and disposes of the basic issue of the communist philosophy of materialism?

We cannot look to blind faith in dogmatic revelationistic religion to answer the claims of communism. We cannot rely on the physicalistic psychology that now prevails, for it still timidly clings to the same materialistic philosophy of man that gave communism its authority. Rather, it is the work of a few free explorers, if they can be sustained and supported through the great difficulties that now confront them, that will provide us with the ideological weapons against which communism has no defense.

THE JIG-SAW PUZZLE OF THE GRADUATE SCHOOL

Anna Balakian

Syracuse University

A Plea for Integration in Advanced Studies

Education on the college level has evolved into a cooperative venture and has instilled in the students the spirit of team work in the classroom and at play. A sudden break from this philosophy of group learning and group leisure occurs when the college graduate finds himself a new type of freshman: a graduate student. There, often on the same campus where a short while before he felt such a spirit of unity with his fellow students, the pursuer of new academic initials finds himself in an intellectual and social cubicle. Some universities are candid enough to give concrete form to the concept of the word by providing the neophytes with little chambers of silence and isolation for their search for knowledge. The monastic life, which has been banished from the undergraduate's academic environment, is far from losing its hold on the graduate scholar.

He is confronted with a very isolated field of learning; and soon — as if a label were tagged on him — he has *a subject,* which shall become the center of his mental activities. For how many

years? That depends on financial capacity, mental rapidity, state of health, and durability of interest.

In a world where teamwork has become the primary element of human progress, the graduate schools of the humanities present one of the most striking paradoxes. Whereas in the technical fields cooperative effort leads to an almost anonymous unison of achievement, the humanities have pushed so hard in the opposite direction of individualized research that a gradual limiting of the individual's capacity and scope has resulted. The intellectual productions resulting from this solitary confinement have grown so narrow in interest that it has become the custom to hide them in the archives of the mother university rather than to expose them to the merciless eye of publication standards.

The answer might be proposed that the aim of graduate study is not the validity or importance of the thesis or dissertation, but the disciplines thereby acquired. But what do these disciplines comprise? Consulting card catalogues, taking profuse notes from reference books that may give the comforting support of an authority to one's own timidly budding thoughts, analysis of the contents of first hand informative reading! At long last an attempt to express in clear and correct English the final discovery after it has been corrected and revised by harried faculty advisers who wonder why some one before this did not teach the student organization and sentence structure! When at last another commencement arrives, and an M.A. or Ph.D. is earned, the student realizes, as he stands with a number of others in a more elaborate gown than his previous one, that there were others who haunted the stacks with him and have finally reached the same level of authoritative knowledge of a peapod of scholarly information.

The basic weakness of our graduate program is the very meager chance it affords for a core curriculum. Even when the regulations in the catalogue allow a student to take courses outside of his own field, he seldom dares avail himself of this opportunity. Aware of the "Comprehensive" ahead of him, he knows that he can ill afford the luxury of wandering very far afield of his major interest. If courses in the allied branches of the humanities were not the dessert but a more substantial part of his academic menu, the graduate student would be strengthening his creative potential and sharpening his vision. A lot of idealistic dreaming can be done on this theme and its multiple variations.

If the Ph.D. candidate in English literature studied foreign languages not for the purpose of passing a stereotype language requirement test but to acquire the key to a more fertile domain of research, and to be able to point out to his students the salient family traits of western culture, he would be a richer scholar and a more challenging teacher. On the other hand, the language expert often amazes his colleagues in foreign lands whose literature he knows so well, when they discover how little he knows of his native heritage. The same criticism could be made of the curriculum of the psychology major, who may spend hours and years studying the social behavior of the abnormal or of monotonous mediocrity, and from it draw rules of behavior, but who is all the while deprived of the richest source of information on his subject: the behavior of men as gleaned by the creative genius of man—frustration as observed by Flaubert, delusions of grandeur as perceived by Dostoevsky, the Oedipus Rex complex as sensed by Sophocles or Shakespeare, neurosis in women as analyzed by Ibsen, homosexuality as explained by Gide, and so many other examples which would take his field out of the clinical and the actual into the sphere of the universal and the potential. And what could not be said of the mathematician who had also studied philosophy? The Cournots and Einsteins would not be rare phenomena but might thrive in many a university and make of that subject so often avoided by underclassmen a source of general culture and a challenge to mental activity.

The geographer who estimates the physical destiny of a land gains in the eyes of his students and his administrative superiors if he is named a member of an expedition and has occasion to come face to face with the material reality of his investigation. To what greater, far-reaching service he might put his knowledge if he could integrate — as he sometimes does, but too rarely — the material productivity with the cultural creativeness of a region?

The same isolationism or sectionalism is practiced within the specialization itself. The medievalist is or pretends to be ignorant of modern literature, etc. If there were more integration within the branch itself, one of the dubious practices in scholarly research could be eventually eliminated: the monopoly accorded to a limited number of scholars in each field to pass judgment over any new research in that field intended for publication in the handful of periodicals available for this purpose. The abnormally weighted specialization of these authorities sometimes results in such prejudices of understanding of the subject that the fresh point of view of a newcomer to the field, or the attitude of an unspecialized scholar free of the specialist's obligatory list of references, will appear immature or unbaked.

Others, in scrutinizing the deficiencies of the graduate level of education, have implied or proposed complete reconstruction rather than an amelioration of the present set-up.[1] It is the pres-

[1] Cf. Howard Mumford Jones, *Education and World Tragedy*, Harvard University Press, Cambridge, 1946.
Glen A. Reed, "Fifty years of Conflict in the Graduate School," *The Educational Record*, January 1952.

ent writer's conviction that most graduate schools in the country possess within their organization the sound though dormant material for the construction of an integrated course of advanced studies. It is upon this assumption that the following proposal of interdepartmental core curriculum is based, suggesting integration along four fundamental lines:

1. Correlation of subject matter.
2. Interrelation of the methods and tools of research.
3. Psychological orientation toward abstract thinking.
4. The sharing of knowledge.

The critical attitude evidenced in these comments is prompted by serious concern for the failings of an educational system deeply cherished by the author. Nothing arbitrary is intended by the plan here set forth. Many other patterns of grouping could work out just as well. The essential is to awaken to the urgent need of doing the grouping across departmental lines for at least part of the graduate curriculum.

Correlation of Subject Matter

Although the present system of specialization may have made it impossible to produce the giants of integrated knowledge, each university possesses valuable components whose combined effort can constitute a synthetically integrated core curriculum.

To give an example from personal experience, I have been able, with the cooperation of the forward-looking new dean of our University College, Dr. Alexander Charters, to organize for general consumption on the adult education level a course which in form if not in exact contents could serve the graduate student's needs. Entitled "European Literature in our Time," the course consists of a pool of the literary resources of faculty members in seven different fields. The organizer, assuming the responsibility of establishing a continuity (if not complete unity) can lend uniformity to such a course in the matter of procedure if not in contents. No two of the seven college specialists had a similar approach to literary problems, but all submitted to a pattern which minimized the dissimilarities in style and personality. No lecturer assumed any previous knowledge of his subject on the part of the students. The authors featured were treated as illustrations of general literary trends of the epoch, and whenever possible as representative of national outlook or character. In a sense, the coordination went beyond literature; it involved in addition the relationship of the work of art to the local color and to the basic European anxieties created by experiences, commonly shared, of wars and economic instabilities. Standardization in the matter of presentation included mimeographing of pertinent selections from authors discussed, and of basic non-technical bibliography, and uniformity of class procedure consisting of a period for lecture and one for question-answer.

There could be a course of this nature organized for every literary movement, cutting collaterally across national divisions and language barriers: a horizontal presentation of literature instead of the standard vertical ones of chronology.

Through cooperative effort on the part of faculty and administration, courses could be organized applying one field of knowledge to another, such as: the psychological interpretation of literary masterpieces, the *Bible* in world literature, a geographical approach to regionalism in literature, the mathematician as philosopher, the sociological import of naturalism, the literary man as historian, the study of Latin as the basis for scientific terminology, to name only a few possibilities.

At the moment, some aspects of the correlation of subject matter are being attempted on the undergraduate level. However, it is our opinion that integration should begin on the graduate level before it can attain its objective in the undergraduate curriculum. The capacity for coordination in immature students exposed to a series of units of correlated material is not developed to a degree at which they can by their own initiative comprehend the inherent unity. The professors involved in the topical unit would have to work together and have enough knowledge of each other's specialization to point up the relationships. But if the professors do not possess the habit of integrating knowledge, the core curriculum is apt to be a core only in the catalogue. On the other hand, if the scholar has himself had the opportunity to be trained upon a broader basis of knowledge as a graduate student, he is more likely to create a genuinely coordinated course of study for a future generation of undergraduates.

Another course essential to students in all departments of a graduate school is in the writing of English as a means of conveying specialized knowledge. Included in the course would be the organization and writing of articles, monographs, and that most important thesis or dissertation, as practice for the future writing of books and "papers" for publication. One wonders how many fresh sources of information, judgment, and insight are lost to thinking readers as a whole and to students in particular, because the possessors of these fine qualities of mind do not also possess the means of easy, clear expression to put more abundantly into writing their knowledge.

Interrelation of the Methods and Tools of Research

Here is a field of graduate training to save the new scholar from heartache and loss of time, and even a sense of futility. The study of the tech-

niques and tools of efficient research would be intended not for the students of a single department but for all those in the division of the humanities.

An outline of such a course or courses would reveal many features which have found a place in the graduate curriculum of schools of education but are generally excluded from the humanities' curricula.

1. Initiation or orientation to the library as a place where you do not *ask* for books but *find* them yourself.
2. Methods of note-taking: profuse vs. cryptical annotation.
3. Reading techniques: the uses of rapid and intensive reading.

Psychological Orientation Toward Abstract Thinking

For this aspect of cross-departmental training we must draw the psychologist out of his school of education and the philosopher from his inner sanctum to make their contribution to the graduate student's welfare in such important matters as thought development, formation of judgment, the recognition of the aesthetic versus scientific approach to evaluation, and the strengthening of that most essential faculty of the mind — concentration, brief spaced and sustained.

It is amazing to find so many intelligent college graduates who do not distinguish between inductive and deductive thinking, whose appraisal of a work of art consists of an elaborate résumé, to whom analysis means synopsis, and synthesis repetition, who are ignorant of the difference between historical versus critical approach to literature, or of the appropriateness of subjectivity versus objectivity on a given research project. Proximity with the mathematics specialist in a cooperative course would help the literature student immensely in understanding the process of deductive thinking; working with the historian might teach him organization. Inversely, the scientist and historian could be made more keenly aware of the variability of judgment produced by the element of taste and aesthetic insight.

The Sharing of Knowledge

There are certain aspects of conveying knowledge that cannot be taught either by a departmental or cross-departmental staff consisting of philosophers, pedagogues, or statisticians. A single inspired professor with dramatic ability and enthusiasm for teaching can probably do more to demonstrate to the graduate student that three-dimensional empathy of teacher, subject, and student, which is the basis of ideal pedagogy. This is a *mystique,* as the French call that spiritual cognizance of fact and feeling, and can be communicated or intuitively realized only in the case of the graduate student particularly gifted for teaching.

There are, however, tricks of the trade, which a professor generally masters after a number of years of experience, and which, properly located in his training program, could be part and parcel of college teaching earlier in the game. Certainly, discussions on course organization, knowledge of standard text books and their contents, need for new texts, should be as important a concern to the graduate student in his training years as establishing the date of a minor document or discovering the literary fortune of Balzac in Thailand. Most important of all, a course is indicated — running parallel to the study of books from the point of view of their intrinsic merit as literature or document — in which texts may be examined and judged on the more practical basis of their suitability in the college classroom and pertinence to present-day outlooks.

Another essential part of this training should certainly be the study of the correlation value of certain fields to other fields, and the development of techniques for direct and indirect reference to related fields in the undergraduate programs. As things stand, most of the correlations that professors make in the course of their lectures are chance occurrences or time-consuming digressions.

It is ironical that the elementary and high school teacher, who will have little to say in the choice of books and can rarely participate in course organization, has the opportunity to learn about these things through required education courses, but the future college teacher, who will have much more independence in conducting his courses, can sidetrack these subjects in his graduate program of studies.

Even test making and the evaluation of present types of examinations could be a pertinent part of every graduate student's training, and not remain the private property of the candidate for a doctorate in a school of education. This training should not be theoretical or the fruit of impersonal statistics but achieved through a pooling of academic manpower and experience within the framework of a genuinely integrated graduate school, in which students would feel the scope of the allied humanities and the united power of the liberal arts pointing a decisive finger at uniformly higher standards. They could thus envisage a clearer pattern of the universal ideal inherent in humanity's intellectual treasures, of which they aspire to become keepers and investors.

At the present moment the graduate schools in our country seem like an attractive painting that has been cruelly cut up and its parts scattered like the pieces of a jig-saw puzzle. The values are all there but deteriorating because of their unfruitful independence. Unifying forces, bringing the parts together, would create an intellectual scene in whose climate not only great scholars and teachers could be made but even the creative leaders of our country could be nurtured.

C. G. Suits, Director of Research of the General Electric Company, writes on "The Engineer and the Fundamental Sciences" in the February 1953 issue of *Scientific Monthly*.

The author points out that neither science nor technology was a recognized component of primitive industry during the period of industrial development between 1770 and 1850; however, the bases of modern industrial technology were being laid in the scientific work of this period.

The trained engineer had appeared on the American industrial scene by 1850, about the time that a number of our schools of engineering were being founded. "Around 1900 the engineer and the scientist could be clearly distinguished as separate professional specialists. In the first place, the engineers were to be found largely in industry, and the scientists were almost entirely in the universities. Scientists in industry were somewhat apologetic concerning their defection from professional tradition; and industrial engineers, on the other hand, were equally apologetic over any dealings with scientists, who were known to be a thoroughly impractical and visionary lot."

The process of the integration of science into the industrial complex has continued, and now in many instances scientists and engineers are specialist members of teams on research projects. A measure of the impact of science and technology upon our culture is given in the author's figures: "The number of chemists in U.S. industry has doubled in the past fifteen years, and the number of physicists has doubled in the past eight years. Another interesting index is provided by the tabulation of the number of companies which recruit at the colleges. In 1916 only 12 companies did so. By 1929 this had risen to 750 companies; by 1942 the number was 1500; and during 1952, 5200 companies recruited at the colleges. I see no indication that this clear trend in the employment of trained people for the development of industrial technology will not continue long into the future. Technology is based on science, and science seems to be boundless."

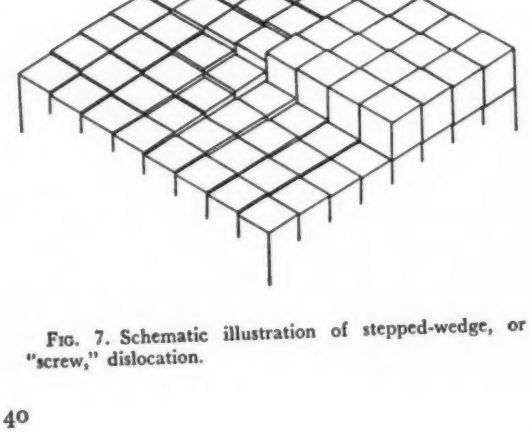

FIG. 7. Schematic illustration of stepped-wedge, or "screw," dislocation.

Of the several examples that Mr. Suits gives of important fundamental scientific observations that have been a vital key to industrial progress, the one that deals with the mechanical properties of solids is of especial interest.

"In the hands of metallurgists, the study of the solid state is yielding new knowledge that is destined to have a correspondingly important bearing on mechanical technology. The strength of materials, especially of metals and alloys, is a primary limitation on the capabilities of the vast galaxy of machines that pace modern civilization. . . . Without exception, these metals and alloys are crystalline solids, and the problem of improving and extending their properties reduces, in its most basic form, to the problem of understanding the mechanics of crystals. . . . There is no doubt that a crystal is a regular three-dimensional array of atoms, and, from a knowledge of the atoms and their arrangement, it should be possible to deduce simple mechanical properties. . . . If one attempts to calculate the tensile strength of a crystal from this simple picture of atoms in regular array, the calculated result differs widely from the measured tensile strength. . . . There are similar difficulties in interpreting other practical properties of crystals in terms of perfect crystal structure. Measured rates of diffusion, rates of solution, rates of crystallization, and rates of phase change, for example, all very important in metallurgy, defy interpretation on the classical basis of crystalline regularity. The key to these problems of great theoretical and practical importance lies in the defects of crystals. Everyone has known for a long time that crystals are generally not perfect, but it now appears questionable whether any example of a perfect crystal has ever been seen, at any time, by anyone! Hence it is not the geometric perfection of crystals, but their invariable imperfections, which determine the practical properties of crystalline solids such as metals and alloys. Concentrated study of the detailed nature of these defects is now revealing for the first time the fundamental nature of the properties of the materials upon which our mechanical civilization rests. A beautiful example of the role of the crystal defect is shown by the growth of crystals from a saturated solution. A perfect crystal would grow very slowly indeed, because the perfect plane crystal faces are atomically smooth, and hence resist the attachment of an atom from the solution. Practical crystals are, however, full of defects and structure discon-

tinuities, in the neighborhood of which almost all the phenomena of crystal growth occur. These growth phenomena have been observed under the microscope, and have even been photographed in motion pictures. Such motion pictures illustrate in a graphic way the crystal growth associated with a stepped, or screw, dislocation. This particular dislocation appears to be a very important one in many practical cases. The geometry of the stepped-wedge dislocation is illustrated schematically in Figure 7. . . . The stepped dislocations that lead to this phenomenon presumably arise in nature from a variety of causes — impurities, strains resulting from temperature and concentration gradients, and the like. . . . *The practical properties of crystalline solids reside in their lattice defects, not in their crystalline regularity.*"

"The Relations Between Biology and Other Sciences" was discussed by J. B. S. Haldane before the 39th session of The Indian Science Congress Association held in Calcutta in February 1952 and printed in *Science and Culture* 17 (10): 407-412, 1952.

The author pointed out that science advances both when a new question is asked and when it is answered. He explained interrelationships among the various sciences and that discoveries in biology have resulted in important insights in other fields. Good examples of this are found in biology and mathematics. Observations on the movement of organisms and the growth of populations contributed in the development of integral equations. The surveys of variations in human heights and research in heredity led to the theory of correlations and statistics.

Mr. Haldane reminds us that physics has furnished radioactive tracer elements to the study of metabolic activity of organisms. There are also the many tools, such as microscopes, that require a knowledge of physical principles for their construction and operation. A background of chemistry is required for the study of the reactions that occur within living cells and the detection of substances produced by them. Genetics may be useful in interpreting these results. The application of genetics is of practical value in agricultural science in the production of better strains of the plants that are used for foods.

The methods of geology and biology are combined in palaeontology. The kinds of fossils and areas where they are found may indicate the continental drifts of past ages. The present distribution of land animals and fish gives further information on the geological changes that have occurred. Antigens are used to demonstrate relationships among groups of people. The author suggests that India offers primitive aboriginal tribes that could give valuable anthropological information; however, the work must be done immediately because the populations are now interbreeding.

In logic, moral and social sciences we are reminded that Darwin demonstrated the unity of life, that biochemists show the similarity and, in some cases, identity of life processes in animals and even in plants. Many animals have the power to communicate. Mr. Haldane believes that many animals have a "code of honor" from which we can learn moral lessons. "The most important thing that man can do is to realize, in thought and action, the unity of all living, or at least of all sentient beings." —*Ruth Lofgren*

"Avenues of Service" is the title of a paper by Bernard E. Schaar in the June 12, 1953 issue of *Science*. Based upon an address made by the author in 1952 on the occasion of his receiving an honor scroll in recognition of his services to the chemical profession, the early part of the paper discusses the function of professional societies and the means they afford individual members for service to their professions and the community.

He then discusses the public relations programs and aspects of science in familiarizing the lay public with the activities and discoveries of the professional scientists. In this connection he says that ". . . the lack of authentic information on scientific and technological developments and their social concomitants that mold our life and continually change it makes it imperative that people be better informed."

Using his own field, chemistry, as an example, he discusses its importance to everyday life and comes to the methods by which it is taught both to those electing chemistry as a profession and to non-chemistry majors.

". . . However, it seems to me that in courses intended for non-chemists, if less emphasis were placed on the technicalities of chemistry and more on its social meanings, its universality, and its scientific method of discovering new facts, there would be more general understanding of the humanizing role of chemistry, and less antagonism to scientists.

"Such a course would justify itself, I think, if it served no other purpose than to enable one to get a glimpse of the hidden beauty of the natural world in which we live, or to view with greater humility the mightiest works of men. Even those who intend to become chemists might well profit from this type of presentation."

Schaar reminds us that "in a world increasingly dependent upon scientific findings for many, although not all of the good things of life, the special competence of scientists lies in helping people to acquire their ability, and their will, to unshackle their minds when attacking new problems in their field." — H.W.C.

Last December at the St. Louis meeting of the A.A.A.S., Dr. Cornelis W. de Kiewiet, President of the University of Rochester, gave an address at the Conference on Scientific Manpower. A

paper based on this address appeared in the February 1953 issue of *The Scientific Monthly*. Entitled "Education for Survival," it may have been passed over by many as being a typically war-mobilization thesis, but this is not its tone. It should be required reading as a statement of the place and importance of education in the modern world, in which Americans are a minority group.

The author emphasized that there is no substitute for a far-ranging national concern. "There is still a great deal of ignorance and indifference even in universities and colleges about the skilled manpower needs of the country. It is false to assume that with an ample supply of students, higher education can therefore undertake to provide an adequate flow of trained people who will be reasonably well distributed in those areas where they are most urgently needed. Neither the social sciences nor the humanities has done nearly as well as the physical and natural sciences in adapting teachings and research to the new context in which American society has its being . . . There must be trained soldiers, a flow of engineers, assistance for essential industry, the sponsorship of scientific research. But if we are to cope with historic tasks comparable only to those shouldered by Rome or Great Britain at the height of their power we need a supply of knowledge and experience far beyond present levels. Even a world war, if that must be our fate, needs men who know geography, languages, and historical traditions. Although we might explode our way through to a military victory, illiteracy in these things would, as has happened before, turn the greatest victory into defeat.

"The simple equation of a skilled manpower policy with the flow of soldiers, scientists, and engineers is both wrong and dangerous. The total policy of a nation is too important and complicated to be guided solely by the recommendations of generals and engineering deans."

A possible solution to the needs of our rapidly changing world might be found in a closer adjustment of the curricula of the high school and college. "A greater effort must be made to see the entire eight years of high school and college education as a continuum. The rigidities and exclusions inflicted by high school systems upon college, and perhaps in greater degree by college upon high school, must be replaced by a bridge of cooperation and understanding between both . . . One of the most rewarding fields for foundation enterprise would be in this wasteland between high school and college, this limbo in which linger the immature talents of so many young people."

Dr. de Kiewiet reminds us that in the final analysis there is no substitute for the qualitative development of our best brains. Our educational system is the most valuable ally of our foreign and military policy. "In an assessment of American power, higher education has the same stature as our system of food production, our industrial organization, or our system of defense. Yet education at all times has greater difficulty in presenting its case than any other essential activity . . . The highest function of education is to make human experience contemporary; that is, to make it available for use in the life of a man or a nation. Yet a great body of scholarship remains antiquarian, and many scholars withdraw into a grammarian's funk hole, because this is safer than to deal with the great issues of the age. As a result society is the poorer for want of the wisdom and the understanding that can only come from scholarship.

"There are orders of skill and expertness to which no ordinary measures apply. They are beyond the reach of specific training and scholarly method. Wisdom is the power of seeing things as they really are, and of counseling men to choose those actions which increase the total of peace and justice and charity in the world. Genius is the quality of the special spirit, whether in poetry or politics or science, which raises a man above a single locality or nation to influence the people of the world. To wisdom or genius we can assign no price that any purse can pay. Nor can we devise any curriculum guaranteed to produce them. All we know is that they are likely to arise in an atmosphere where thought and learning are held in honor." —*Ruth Lofgren*

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In the span of the few weeks since its publication (September 28, 1953), it is obviously impossible to make the thorough analysis which is obviously required and richly deserved by ***Alfred North Whitehead, an Anthology,*** selected by F. S. C. Northrop and Mason Gross (The Macmillan Co., N. Y., 1953, 928 pp., $12.50). We are compelled, however, to alert our readers immediately to the appearance of this garnering of the thought of this great mind in fifty-five chapters of his major works, showing the development of his philosophy from 1906 to his last lectures in 1938.

The reader should be assured that the first 82 pages on "Mathematical Concepts of the Material World," so replete with mathematical symbolism as to be terrifying to the layman, are not representative of the entire book. The appearance of this as a first item is dictated by the chronological arrangement. The lead-off selection (1906) is here reprinted in its entirety for the first time and has been chosen because it represents an important stage in the development of Whitehead's philosophy. It supplants in this volume much of Whitehead's earlier work in mathematics and the three volumes of *Principia Mathematica,* of which Bertrand Russell was coauthor.

It is our hope that every member of a college curriculum committee and every superintendent of schools and high school principal will at least dip into this volume deeply enough to listen to Whitehead on "The Aims of Education." How far we could have come since 1917-1927 if we had heeded his words when he first wrote them! In 1923, for example, he spoke of integration: "The life of man is founded on Technology, Science, Art, and Religion. All four are inter-connected and issue from his total mentality . . . No social organization can be understood without reference to these four underlying factors."

In these days of confusion, after all these years of specialized education and vocationalism, it is a bit humiliating to realize that Whitehead spoke in 1927 on imagination, freedom, and zest for life in education. "It is a libel upon human nature to conceive that zest for life is the product of pedestrian purposes directed toward the narrow routine of material comforts. Mankind by its pioneering instinct, and in a hundred other ways, proclaims the falsehood of that lie."

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of the social sciences today. It may be that here again, the author restrained himself in practical wisdom to matters largely free from controversy. If the book has faults, they lie in the vacancy of certain areas. For what material is present is excellent in conception, careful in execution, and serves as a useful guide to the scientist who wants to know the methodological context in which his theories operate. —*Henry Margenau*

Increasingly large numbers of educators at all levels are agreeing to the necessity of restoring the balance between scientific and vocational disciplines and the liberal arts and humanities. This is a welcome indication indeed but we have often felt that even the protagonists of liberal education do not state their case with clarity and very often leave one to guess what they actually mean by "the humanities." No better and no more timely a statement as to the nature and importance of the humanities could be desired than *The Changing Humanities,* by David H. Stevens (Harper & Brothers, N. Y., 1953, 251 pp., index, biblio., appendix, $4.00).

The author, formerly Director for the Humanities of the Rockefeller Foundation, makes his "Appraisal of Old Values and New Uses" by presenting an excellent history of the humanities in education as a well-organized and far-ranging display of fact delicately seasoned with wisdom and sensitivity which find their expression in fine literary style. The book should be inwardly digested by every teacher and educational administrator for it should be an invaluable aid in the reconstruction of curricula. More than that, no intelligent person could help but be moved by the scale, the variety, and the nuances of the achievements of the human mind as they are here shown to him.

". . . like man himself, the humanities are out of time, but always timeless and changing," says Dr. Stevens in his brief introduction, and continues, ". . . They do not belong to any class or profession of men. Rather they are the embodiments, in forms that all can understand, of the learning, experience, and expression of humanity. . . . Like ourselves, they depend on what is past and follow opened paths into the future. They put upon every individual a compulsion to use whatever he gathers from humane experiences in his every act and expression; this natural necessity of personal identification with what we learn of mankind, creates new life out of the old."

For those who would claim that the humanities and the liberal arts programs in schools and colleges are "impractical" the author has much to say — very nicely but nevertheless very pointedly. Without education in languages, histories, philosophies, literatures, etc., there can be no real human understanding among peoples of different cultures and backgrounds. Without real human understanding, commercial, economic, technological, military, and political dealings among such peoples are under serious handicaps. These sad lessons have been learned by a few the hard way. Repeatedly one finds in this book evidences of the dangerous unpreparedness of this country to deal with other peoples either as friendly allies or as real or potential enemies, and just as often there are implications of the extreme importance of solid foundations in the humanities if our country is to rise to its opportunities as a world leader. One world cannot be built on science, technology, and commerce any more than the individual man can live by bread alone.

In consideration of curriculum revisions in school and college to counteract our too-common vocationalism and emphasis on science, one often gathers that the humanists would have us go back to the "good old days." It is therefore heartening and important to read in this book the following paragraph:

"The humanities experience changes that are as remarkable as those in the sciences. These are less easily discernible in their academic surroundings, and in immediate social consequences less important; yet in time their effects will be as far-reaching and as important for human welfare. That venturesome statement is supported by facts less arresting than earth-shaking discoveries in distance-destroying invention. Sciences operate in space and in matter: the humanities are within us. Their benefits are given and received at every level of need above that of simple physical existence. They have, too, the power to make physical burdens and deprivations tolerable to man as they increase his inner strength. . . .

". . . New and more refined methods for humanistic study have been developed by analytic investigations. Finer critical appreciation and expression have come out of an improved understanding of human growth and development. We know better how to teach languages by going from classrooms into laboratories and we similarly have taken the arts into studios and studies where the individual can apply what he knows and feels. Also, humanists today see many opportunities lying beyond academic boundaries which had not seemed to be their moral, spiritual, and aesthetic concerns. They know that intellectualism is not enough, and more than ever before possess the means to demonstrate their beliefs by making their academic world a working part in this total one."

While integrative education requires that modern science make its concepts available to the humanities, the author recognizes that ". . . humanistic studies will need a definition that today is lacking. A balance is wanted, between means and values, that the undergraduate may see where he is going and the graduate student discern his own clearest opportunity in accord with his known talents. That balance will restore a sureness of purpose . . . and faculties will regain that sense of direction which failed under the constant revisions of liberal education." In our opinion, the wealth of material which this book brings together should provide valuable insights into the restoration of that balance and should do much to bring to the whole of education a sense of meaningfulness. —*H.W.C.*

In Julian Huxley's latest book, *Evolution in Action* (182 pages; $2.75; Harper and Brothers, 1953), the general reader is given the rare opportunity of examining the process of evolution with the wisdom and perspective of this most able biologist. The principles and tendencies common to all life were drawn from the mass of detail of the various disciplines of science and history and ordered to reveal a single evolutionary process. The author believes that a knowledge of man's origin and destiny is essential for an intelligent approach to the problems of our age, so burdened with doubts and uncertainties.

In the first chapter the author reviews the whole of the process of evolution. Taken in the broad sense all reality is evolution, the interrelated partial processes within the single universal process. "The overall process

of evolution in this comprehensive sense comprises three main phases; although there is continuity between them, they are very distinct in their main features, and represent three sectors of reality, in which the general process of evolution operates in three quite different ways. We may call these three phases the inorganic or, if you like, cosmological; the organic or biological; and the human or psycho-social. . . . The inorganic sector comprises all the purely physio-chemical aspects of the universe throughout the whole of space . . . the mechanism of its transformation is of the simplest kind — physical, and very occasionally chemical interaction.

"By contrast, the spatial extension of the biological sector is very much restricted. Living substances could not come into being except in that small minority of stars which have produced planetary systems . . . which are of the right size and in the right stage of their history for complicated self-copying organic molecules to be produced; and in them again to an infinitesimal surface shell.

"The human phase of evolution, what I have called the psycho-social sector, is again enormously more limited in spatial extent. . . . Once again, a new method of transformation has become available in this sector — the method of cumulative experience combined with conscious purpose."

The author explains with illustrations and examples the process of development every organism goes through as it "constructs itself." This is followed by a description of the way in which individual development tends to recapitulate evolutionary development: at least the ancestral plan of structure. Mr. Huxley discusses the three possible alternatives as regards the origin of living substance on this earth.

"Today we can see life as a unitary process, made up of a number of smaller processes. The individual organism is a process within a species, the species a process within the radiation of a type, the radiation of a type a process within the succession of dominant groups, and this in turn a process within the overall process of realizing new possibilities of variety and organization."

For the remainder of the book the author elaborates the principles and trends of evolution with examples that make the process come alive. He explains the two key concepts: natural selection and biological improvement. Natural selection in the long run results in something that deserves to be called improvement. "However, I must warn you that 'improvement' is not yet a generally recognized technical term in biology.

"Natural selection plus time produces biological improvement . . . If we take a snapshot view, improvement eludes us, and we see only competition and struggle. But as soon as we introduce time, we see trends of improvement . . . On the other hand, improvement is not universal. Lower forms manage to survive alongside higher ones . . . Most improvement is specialization — it is improvement merely in relation to some restricted way of life or habitat . . . We can consider the process in relation to three different standards. For specialization and detailed adaptation the standard is the survival of a particular line of living substance. For advance, the standard is the general efficiency of biological machinery. For progress, the standard is the process of improvement itself." The author goes on to discuss the development of a brain capable of mental activity and finally able to build a symbolic world. He denotes the differences that the abilities of abstraction and generalization make between man and the animals. Man alone possesses the faculty of imagination with which he can grasp in a single act of experience, subconscious and conscious, a complex situation involving facts and ideas, emotions and judgments, the past and the present and the imagined future. "The great complexity of human mental organization gives it an enormous range and depth of new consequential possibilities. And evolution in the human phase is essentially the adventurous and stormy story of the emergence of ever more of these possibilities into actuality.

"Progress is constantly leading life into regions of new evolutionary opportunity." Mr. Huxley presents such an inspiring and challenging view of man's development and destiny that the reader cannot help but find its optimism infectious. He has indeed succeeded in his desire to "have given you some feeling of the unity and sweep of the process, some sense of its broad trends, some understanding of the general forces at work in it; above all, if I have helped to give you some insight into its nature as a self-transforming process, constantly generating new patterns and novel qualities, building its future by transcending its past."

—Ruth Lofgren

Science in Synthesis is a report of the summer session of the Albertus Magnus Lyceum for Natural Science, conducted in July 1952 at the Dominican College of St. Thomas Aquinas, River Forest, Illinois (published there 1953, $2.50). It can be cordially recommended to the layman who is interested in the special Catholic aspects of the efforts now proceeding everywhere to accommodate education to the last fifty years of scientific advance. The writing is lucid and simple, and direct. For this company the question begins with Galileo (as it does with all studies of the sciences) but turns, of course, chiefly on whether the positions of Aristotle and St. Thomas have been superseded. Physics, biology, and psychology were in that order reviewed. The summary conclusions about the first section are on page 61 and end with a question: Is a deductive science of nature possible? The answer was held to be affirmative only as to mathematical formalism. (This is also Maritain's view.) It is in the negative as to full physical reality.

The biology discussion also led to more questions than answers. The following were to be the agenda for the 1953 session: "(1) What is life and a living organism? How to provide a definition which meets all the data of modern biology and its research needs? (2) In view of modern biological knowledge, is a unified theory based on a properly biological approach feasible?"

The section on psychology is brief, forty-one pages, about half being directed to the cognitive problem.

The general conclusion of the conference is as follows:

"It would seem, therefore, that the most fruitful approach in physics and in all branches of the science of nature is to trace some of the fundamental physical concepts (such as the *continuum, time, place, infinite* and *action;* or *life, organism, function, structure,* etc.) which are actually involved in contemporary theory, back to their origin in the scientific tradition." *—F.L.K.*

NEWS AND NOTES

In this note comments will be made about the first group of current curriculum self-study reports now coming in from various colleges. The criterion to be here employed is their bearing upon over-all integration. For brevity we draw in specific references from two church-related institutions (one Catholic and one Protestant) and one secular university.

By way of introduction we should observe that the studies made possible by Ford Fund grants cover the entire curriculum. Others, no less searching, usually concentrate upon the college's general education program, variously named directed studies, arch courses, basic college, and the like. The University of Pittsburgh actually committed its thorough study to its Committee on General Education, and the report has therefore a sustained tone of consistent purpose. The Southern Methodist University study supplies a remarkably searching statistical treatment. We recommend the reading of the brief analysis by Dean Gerald E. Dupont of St. Michael's College (Winooski, Vermont) as an instance of the Catholic treatment of the subject. (This will appear in more detail in a later issue of MAIN CURRENTS.)

Reports thus far received are for the most part committee findings and recommendations. What will finally emerge after faculty action upon these (often large) volumes is to be seen. But a first point we can make with conviction even now: *The spread of general education programs over the land in the forties is about to be followed in the present fifties by a second nation-wide wave of basic revision.* Will this decade of basic revision provide students with genuine opportunities for philosophical deepening, as the last began the process of broadening?

At present the answer to this is in the negative. The reason is also clear: There is little focus on method, or suggestion of setting up a course in which method and content for a consensus will be worked out.

The second point which emerges from these reports is the awareness of students and alumni alike that cross-connections are actually deficient. At Southern Methodist University the alumni sample of arts and sciences, business, and engineering groups was asked whether undergraduate education placed too much, too little, or about the right amount of emphasis upon: training in the specific skills needed for vocational success; the methods by which facts are obtained (as distinct from the facts themselves); critical examination of values in conduct and social action; discussion of different (varying) points of view; individual freedom and creativity in thinking; broad, general cultural courses; relating the content of one course to another. In responses, by far the highest degree of discontent was with the last item.

It is obvious that the mere ideal description of the liberally-educated man does not constitute the prescription for his production. We have already come more than once upon the Harvard formula (in *General Education in School and College,* page 19 et seq.), and it is bound to be quoted in other self-study reports. It includes this passage:

"A liberally-educated man demands freedom. 'We call those studies *liberal,*' wrote a Renaissance educator, 'which are worthy of a free man' . . . and we might add today, of a free society. Education designed to free individual human beings from the limitations of ignorance, prejudice, and provincialism makes sense only in a free society and can flourish only within such a society. By a free society we mean one based on the belief that individual persons are ends in themselves, that men are reasonable beings, equal in rights, and that government exists only to foster their freedom. When totalitarian dictatorship triumphs in the modern world, truly 'liberal' education is the first object of attack, since it is one of the most obvious bulwarks against the brutalization and atomization of the individual. To put the matter another way, a democratic society can never develop if the individuals composing it are merely specialists with no significant knowledge or beliefs held in common. The only way to organize a society of pure experts who have little or nothing in common with each other is through a dictatorship. On the other hand, the ideal democratic society, if there were one, would see to it that its specialists were liberally-educated men. Liberal education and the democratic ideal are related to each other in a thousand ways. It is not too much to say that they stand and fall together."

But how do we make sure that significant knowledge and worthwhile beliefs are had in common? Only if everyone knows (1) what is the valid and agreed-upon knowing process and (2) what is the body of natural-moral law disclosed as operating an intelligible universe.

Dean Dupont lists the eight features which a Catholic college should develop in its students. As to getting results he observes that "the church-related college, and more specifically the Catholic college, is in a much better position. The members of its staff are in agreement as to what constitutes the nature of man, his destiny, his relation to other beings and things in the world. This agreement constitutes a unity of thought which is already an important integrating element. The Catholic college can give a more complete answer to the question, 'What ought a graduate to be and to know?' than can a secular college whose staff is composed of men and women of all shades of philosophical and religious convictions — or lack of them."

As we are all denizens of the same universe, the methods of knowing, and the laws of nature to be known are available to us, upon equal terms. An immense area of agreement can be disclosed, provided the methods and content start with science and are then extended to areas where the methods are still good and the content far less well structured.

At the University of Pittsburgh a member of the self-study committee (Professor Oliver Reiser) has suggested the establishment of a new Department of Unified Studies. We quote from this interesting proposal:

"This new department . . . shall be concerned with seeking the interrelationships between various subject matter disciplines already available in the offerings of the University. The main objective is to cultivate the habit of reflective synthesis and find or create a body of wisdom for human evolution and personal self-development. Since unified interpretation and understanding is not a science in its own right but a synoptic comprehension of antecedent bodies of concepts and principles, this department shall not offer degrees in its own area or 'field.' The Department of Unified Studies is primarily a service department to the students and faculty members carrying on their primary (but not more important) activities in the more specialized areas of study. . . .

"The broad purpose of the 'Advancement of Learning' (to use Francis Bacon's phrase) is to throw light on four basic questions of human existence: (1) What is man? (2) What kind of physical universe (cosmos) is it that man inhabits? (3) By what processes of evolution did the human species emerge from the matrix of nature so that man could become the self-conscious and creative individual he now is? (4) Knowing something about the cosmos and about human nature, what is the best kind of society for man's progressive self-evolution?"

We are now coming to the end of 1953. We have a score or more of powerful organizations: the National Education Association, the Association of American Colleges, the American Council on Education, the American Association of University Professors, the state education departments, the federal office of the Commissioner of Education. Is it not fair to ask the officers of these responsible bodies whether they have not a very special task for immediate performance: to make the discussion of method and content required for integrative experience the central feature of their meetings starting in 1954 and continuing until the decade shows we have done what we knew back in 1940 we were called upon to do, and failed to do in the forties?

We are witnessing today the frightening results of that failure. But it is not too late. Is it too much to expect the great funding Foundations to make this urgent task their special business? Do we no longer believe that American Constitutional Government of free men can be rested and rerested on natural law and defended against communists and fascists, inside and out, as Franklin, Washington, Jefferson, and other believed?

It may be unfair to estimate the value of the recent meeting of the Adult Education Association in New York on the basis of the general addresses, incidental visits with friends, and one's attendance at one of the small working groups, even though (as with this writer) these events be judged well worth while. The officers must receive an impression quite different from that of a single registrant. This may be true of many of the annual meetings of organizations for the advancement of science, education, medicine, and other national institutions. Certainly the actual organization of the large and small meetings of the A.E.A. was admirable, as a feat of management, as is the case also with the A.A.A.S., N.E.A., and others.

But a very general discontent is actually voiced. It may be phrased thus: Are we not doing good work on details, and measurably failing in respect to certain central purposes? Does the Adult Education Association exist chiefly, or solely, to permit of national consultation or the local improvement of particular kinds of programs? Does the A.E.A. not have peculiar national responsibilities for the *climate* in which those local efforts go on? For some time the adult education climate has been worsening. It is true that this is the case with the political atmosphere and many other aspects of our life. In work sessions of the A.E.A. individuals and small groups voiced their anxiety about this deterioration. Sincere piecemeal and local efforts come to little when the whole field is in confusion.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, AND CIRCULATION REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912, AS AMENDED BY THE ACTS OF MARCH 3, 1933, AND JULY 2, 1946 (Title 39, United States Code, Section 233) Of Main Currents in Modern Thought, published 5 times a year at Port Chester, New York, for October 1, 1953.

1. The names and addresses of the publisher, editor, managing editor, and business managers are: Publisher F. L. Kunz, Hillandale Road, Port Chester, N. Y. Editor, F. L. Kunz, Hillandale Road, Port Chester, N. Y. Managing Editor, none. Business manager, Marifrances Wilson, 242 E. 53rd St., New York 22, N. Y.

2. The owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual member, must be given.) F. L. Kunz, Hillandale Road, Port Chester, N. Y.

3. The known bondholders, mortgagees, and other security holders owning or holding 1 percent or more to total amount of bonds, mortgages, or other securities are: (If there are none, so state.) (None).

4. Paragraphs 2 and 3 include, in cases where the stockholders or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner.

5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above was: (This information is required from daily, weekly, semiweekly, and triweekly newspapers only.) —

(Signed) Marifrances Wilson

Sworn to and subscribed before me this 30th day of September, 1953.
Cornelius J. Cregan, Notary Public, State of New York, qualified in New York County.
State of New York, qualified in New York County.
(My commission expires March 30, 1954).

At this level the officers of national societies, such as the A.E.A. have a special opportunity and a particular duty. Free association is endangered and they should be acting to preserve it. They are doubtless working, at the national level, with the N.E.A. and other groups. Cannot future national conferences be directed at major improvements?

As John B. Schwertman has said (quoted in MAIN CURRENTS Vol. 10, No. 1, p. 13): "Learning principles and educational practices more appropriate for adults will emerge only when adult education . . . develops a reason for its existence. In short, adult education needs a theory of its own, if it is to discover what it really is."

The accession of Dr. Ruth Lofgren to the staff of the Foundation for Integrated Education means very much more than raising our number to five full-time workers. Dr. Lofgren is a specialist in micro-biology (formerly at the University of Michigan) who has become concerned about the philosophy and the teaching of biology, as such, as a whole and at all age levels.

As biology is, to many of us, the discipline currently, and perhaps permanently most central to the further structuring of the sciences, the Foundation staff welcomes Miss Lofgren's timely and generous cooperation. Her findings will be reflected from time to time in MAIN CURRENTS. Among the duties she has assumed is coordination of the Source Readings department of the magazine.

A recent swing to and down the West Coast calls for no detailed account of visits to cooperating and newly interested colleges, but a single generalization, based on a repeated experience, may have interest.

The humanities appear to be the scene of intense concern and renewed activity. They are no longer on the defensive. But one is impressed with the continued failure to see that integration without the incorporation of the sciences as cultural experience simply will not stick. Faculties went through all this in the forties, and general education was the compromise, giving breadth, since it could not ensure a union of forces to give depth.

The engineers seem to have clearer vision on this than do the arts and science folk. This point came out in a visit with Dean Llewellyn M. K. Boelter and his colleagues at the University of California in Los Angeles. Our Foundation's origins, program, and methods were described and freely discussed. To the engineer natural law, or natural constancy, is axiomatic. The confusion spread by the professional book philosophers does not so much affect him. To suggest that there is *one* system of order to be discovered underlying all subjects is reasonable to him. Near the end of the evening the suggestion was made, in interrogative form, that in due course might not the New Testament prove to be a text at the higher ethical levels, of the same natural order as is seen materially in chemistry? (The suggestion was not mine, but I assented to it.)

This refreshing directness is good to see; and the assumption of responsibility by engineering faculties for the ethical and professional operative standards of their students is also a good omen.

In general the shift to conceptual integration seems to be proceeding. Or, we may certainly say, the news that it can be done is getting about. We were particularly encouraged by specific union — as at Washington State College, and at Occidental College — of teaching and administrative forces to get results. *—F. L. Kunz*

The adult education courses directed by the Foundation are well under way. The short course co-sponsored with the Staten Island Institute of Arts and Sciences began on October 6th with a lecture, "The Nature of Man," by Dr. Gardner Murphy, of the Menninger Foundation. The five lectures are held at two-week intervals and are given to a capacity audience. Together with Dr. Murphy's opening lecture, the full series consists of "The Nature of Cultures and Societies," by Dr. Clyde Kluckhohn of Harvard; "Modern Ideas in Astronomy," by Dr. John Q. Stewart of Princeton; "Education for Today's Perspective," by Dr. Harold Rugg of Columbia; and "The Meeting of East and West," by Mr. F. L. Kunz, Foundation for Integrated Education.

This course of lectures is an extension of the series of three which was given in Staten Island last season with considerable success.

The Philadelphia course, in its second year, is moving along with as great success as in the first year. The audience (which includes a number who are repeating the course) is as active and as enthusiastic as last year. It is encouraging to observe that the attention of the administrators of a number of colleges and universities in the Philadelphia area is being focussed upon this venture in adult education.

In the light of last year's experience, a very definite effort is being made in the Philadelphia program to assist students in the process of integration. The series of thirty meetings of the course opened with the discussion of "The Knowing Process as a Human Faculty," by Harvey W. Culp. At its quarter points the course will be interrupted to review the materials presented by the lecturers in the light of the integrative aspects of the knowing process. In this way it is hoped that the student can be assisted in seeing relationships and the significance of integration and thus aided in developing his own orientation in a complex world.